we believe it to be the same as our fourth, namely, that which passed us to the south on the 22d. (Extract to Bulletin of October 31, issued at 2 p. m.)

The assumption that the storm of October 31 was but a continuation of that of the 22d appears to be erroneous. It is not so considered in the October report from the Havana Forecast District, and Form 1001, which contain the monthly reports of meteorological observations, do not indicate that a storm prevailed in the Caribbean Sea and the Gulf of Mexico during the above period. We must consider these to have been two independent storms.

In the Avis for November 9 the editor devotes nearly all his space to a discussion of what he terms "harmless cyclones," or cyclones that are unaccompanied by hurricane winds. He points out, as Professor Bigelow has already done, in Vol. II, Report of the Chief of the Bureau, 1898–99, charts 31 and 35 and pp. 454–457, the difference between the circulation in a genuine West Indian hurricane and in ordinary cyclones, such as are common in temperature latitudes, and are occasionally experienced in the West Indies in winter.

Mr. Quin notes that "when the fall of the barometer announces the approach of a cyclone it is impossible at first to tell whether it is a harmless or a destructive cyclone." It is also noted that the absence of the ocean swell indicates the absence of hurricane winds, but no mention is made of the movement of the upper clouds in these mild or harmless cyclones, and we would suggest that this should be a very important observation. In temperate latitudes the ordinary cyclone, unlike the cyclone with hurricane winds, does not perceptibly deflect the direction of the upper clouds. Is not this also true in the Tropics?

In conclusion Mr. Quin says:

Now some of our readers may ask: What is the use of giving so much attention to a phenomenon which you admit to be without any serious danger; what good does that do to any one?

As one part of the answer, we would say that such a study strengthens our knowledge of the laws of the weather, and may one day be of great practical value to any one of us; and for the rest we would appeal to our fellow amateurs whether it is not an intense pleasure to be able to look out with the mental eye over a vast stretch of ocean and see the probable condition of the weather; to be able to follow one of these mysterious and grand natural movements in its course over seas and islands and to say what is likely to happen as it advances. As we remarked in a recent article, the establishment of the United States Weather Bureau in these West India Islands must increase the number of people who follow with intelligence the movements of cyclonic disturbances of all kinds during the hurricane season, and to such we hope that this rather long article will not be found unacceptable."

The editor of the St. Croix Avis is evidently an enthusiastic student of meteorology, and he is endeavoring to interest his readers in the subject, not alone because it will put dollars into their pockets, but because he appreciates the fact that knowledge of any science broadens one's mental horizon and elevates the man. It has been abundantly demonstrated, however, that a knowledge of meteorology and the ability to forecast the movements of storms is of the highest practical value.

We trust that the editor of the Avis will continue his observations, which we have no doubt will be even more interesting and valuable than at present after the receipt of the nephoscope that he has ordered, and that we may have the privilege of publishing his results.—*H. H. K.*

## FRESH LIGHT ON THE ANTARCTIC.

The following quotations are from a review in Nature, vol. 65, page 153, of Louis Bernacchi's "To the South Polar Regions. Expedition of 1898–1900," which is an account of the cruise of the *Southern Cross* by its commander:

Mr. Bernacchi very clearly indicates the character of the antarctic summer, a period of low temperature and high wind, with very frequent fogs and rare intervals of clear weather. He states definitely that Mount Erebus was never clearly visible, merely a glimpse having been had of it—too short to allow a photograph to be taken. On February 19 the ship, as she lay at the ice barrier, was beset with young ice, and broke through with such difficulty that another day's delay would have meant another year.

The specially scientific part of the book is an appendix, though not so called, of fifty pages. It treats of the climate of the south polar regions, terrestrial magnetism, zoology, geology, astronomy, and concludes with miscellaneous notes and a short glossary of ice terms.

In discussing the climate, Mr. Bernacchi founds his remarks on a preliminary study of the observations taken at Cape Adare (latitude 73° south; longitude 171° east), which have been discussed at the Meteorological Office and are to be published by the Royal Society. The winter was not nearly so cold as at continental stations within the polar circle in the Northern Hemisphere, the absolute minimum recorded being —43.5° F. and the mean minimum of the coldest month, August, —22.7° F. On the other hand, the summer is very cold, the absolute maximum being 48.7° and the mean maximum of January (the warmest month, apparently, although there are no values for February), 37.0°; the mean temperature of this midsummer month was only 33° and the absolute minimum 25° F., but a short distance farther south minima below 0° F. were observed early in February. The most remarkable feature, however, was the wind. Windroses are given for each month of the year, showing that the southeastern quadrant of the horizon has an immense preponderance of winds in every month and a monopoly of gales. This is assumed as strong evidence of the existence of a great continental anticyclone to the south; and no doubt that theory is attractive and has much evidence in its favor. But the gales which burst from the east-southeast or southeast were invariably accompanied by a sudden and great rise of temperature, which in eleven cases cited ranged from nearly 14° to more than 44° F. This wind beat against Cape Adare from the level surface of the frozen sea, and does not suggest a foehn effect or an origin in the icy heart of a south polar anticyclone. Does it not rather indicate the passage of a cyclone center to the north and the sweeping in of air from the warm surface of the sea south of Australia? An anticyclone brooding over the southern land would probably tend to turn wandering cyclones eastward along its margin, and the two explanations are thus to some extent compatible.

## A HISTORY OF METEOROLOGICAL WORK IN INDIA.

In the introduction to his administrative report for the year 1900–1901, Mr. John Eliot, Meteorological Reporter to the government of India and Director General of Indian observatories writes as follows:

The first part contains a brief history of the record of meteorological observations in India, and of the gradual development and progress of the Indian Meteorological Department. As this is probably the last administration report that I shall submit to the government, and as no connected account of the operations of the department has been published, it has been thought desirable that I should take the opportunity of my last year's connection with the department to prepare such an account, giving the history of the department up to the end of the nineteenth century, including the first twenty-five years of the existence of the department.

Meteorologists throughout the world will regret the retirement of this able investigator from the position he has filled since 1886. A brief synopsis of his history of meteorological work in India, which includes the work done under his own direction, is perhaps the most effectual way of summarizing for our readers the advancements in meteorology that may fairly be credited to Mr. Eliot.

The history of meteorological observations in India may be devided into three periods, as follows:

1. Previous to 1865, or period of local observation.
2. From 1865 to 1875, or period of provincial systems of meteorological observations.
3. From 1875 to date, or period of the present imperial system.

*Period 1, previous to 1865.*—Mr. Eliot says that amateur meteorological observers in India were confined to a few indigo and tea planters who recorded the rainfall and perhaps the temperature. Almost all meteorological records were therefore made under the direction of government officials; previous to 1865 the observers were usually unskilled assistants, the instruments furnished by the government were unreliable and often improperly exposed, and such records as were obtained were not properly preserved.